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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,412	07/25/2005	Paul L. Smith	0138A-EC-US	8468

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EXAMINER

PARKER, FREDERICK JOHN

ART UNIT PAPER NUMBER

1762

DATE MAILED: 04/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/506,412

Applicant(s)

SMITH ET AL.

Examiner

Frederick J. Parker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 10-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/22/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-7 in the reply filed on 4-11-06 is acknowledged.

Priority

2. PTO records indicate their priority data differs from that submitted by Applicants. Please re-check the information submitted regarding provisional applications and comment on or correct in Response.
3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Specification

4. The disclosure is objected to because of the following informalities: page 7, the patent number "6,132,656" is incorrect; please insert intended patent number.

Appropriate correction is required.

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5. The use of the trademarks "Nafion" (p.18, line 21 and last line; page 19, L.16; page 21,L.8; page 22, L.12) and Teflon (page 22, L. 13) have been noted in this application. Each should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Claim 1, last line; "polymer" lacks proper antecedent basis.

8. The claims 7-9 are considered in view of 35 USC 112/ 6th paragraph.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 1,2,3,5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singer US 4177159 in view of Kemp US 3857737.

Singer teaches a methods and apparatus for forming catalytic fuel cell layers by mechanically mixing a fluorocarbon polymer (PTFE) and pre-catalyzed carbon particulates in a mixing and grinding chamber, the mixture then being used to directly form a cloud in a chamber where it is directly deposited (to prevent agglomeration) by nozzle assist onto a porous substrate (e.g. carbon paper, a conducting support material per claim 3) while a vacuum is drawn (per claim 2) on the substrate. The mixing is “upstream” of the deposition means and downstream of any powder supply means, as is apparent from the context of the teachings and figure, and the particle stream would have impinged (i.e. “to collide or strike”) the substrate during deposition. The catalyst supported on the carbon may be platinum, but is not limited. (See col. 3, 9 to col. 4,12 and col. 5, 9-41). A step of introducing catalyst and support materials to form pre-catalyzed particulates is not explicitly cited.

Kemp teaches that fuel cell catalyst particulates are formed by mixing carbon powder (would be essentially “dry”) with a catalytic metal precursor solution, removing solution to form a powder, and repeating as necessary to provide a catalyst (platinum) supported on a carbon

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powder (col. 2, 18-col. 3, 23; etc). Column 5, 23-26 recognizes such catalyst supported carbon powders may then be mixed with PTFE prior to deposition onto a suitable substrate.

Singer simply does not include the process of making supported fuel cell catalyst particulates in the same process and apparatus as used for mixing and deposition to form coated substrates.

Singer DOES teach such fuel cell catalyst particulates, and Kemp teaches how to make them, and further they are used in processes combined with PTFE to form catalytic coatings on suitable fuel cell substrates, like the process of Singer. Thus there is the suggestion of incorporating the process of Kemp into Singer to provide the fuel cell catalyst particulates, with the advantage of preventing agglomeration (as taught for powders on col. 5) and to have a more compact process. However, the formation of fuel cell catalyst particulates simultaneously in a continuous process with their being mixed with PTFE and applied to a substrate does not impart patentability. No invention is involved in the broad concept of performing simultaneously operations which have previously been performed in sequence, in re Tatincloux 108 USPQ 125.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Singer by incorporating the forming of the fuel cell catalyst particulates of Kemp in the overall process of Singer to provide a more compact process and to prevent detrimental agglomeration of particulates.

12. Claims 4,6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singer US 4177159 in view of Kemp US 3857737 and further in view of Hunt et al US 6132653.

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Singer and Kemp are cited for the same reasons previously discussed, which are incorporated herein. Forming catalytic material by combustion chemical vapor deposition (CCVD) is not disclosed.

Hunt teaches that CCVD is an effective means for forming a wide range of very fine sized powders and powder mixtures (col. 12, 8-49) which may be used to coat a particular substrate, without further limitation. It is recognized on col. 20, bottom that (1) Pt powder may be deposited by the method, and (2) almost any substrate can be coated by the method. The method further involves cooling/ quenching of substrates after coating. The process also provides the benefit of being performed without the necessity of a closed reaction chamber (abstract).

The apparatus of Singer comprises a gas injector and nozzle to direct a fluid stream through the apparatus and forming a stream of particles applied onto a substrate using a pressurized nozzle; vacuum/suction source to draw particles into the substrate; mixing chamber for admixing PTFE and catalyzed particles; and the addition of the CCVD of Hunt introduces same means as Applicants for separately adding catalyst to the carbon support prior to delivery and mixing with PTFE. Consequently claims 7 & 9 as presented are obvious in view of the cited prior art .

The use of consecutive coating apparatuses to apply multiple compositions per claim 7 would have been an obvious modification within the purview of one skilled in the art to achieve synergistic or multiple catalytic reactions, as is well-known in the art.

Since it is apparent from Hunt that platinum particles can be applied to virtually any substrates (e.g. carbon particles), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Singer in view of Kemp by making the fuel cell catalyst particulates of Kemp using the process/means of Hunt et al in that of Singer to provide a


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means and method of producing fine-sized, unagglomerated particles without the hindrance of using a closed reaction chamber.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick J. Parker whose telephone number is 571/ 272-1426. The examiner can normally be reached on Mon-Thur. 6:15am -3:45pm, and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571/272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Frederick J. Parker
Primary Examiner
Art Unit 1762

fjp